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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,337	09/23/2003	Noboru Yamanaka	117263	9281

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EXAMINER	
CAO, ALLEN T	
ART UNIT	**PAPER NUMBER**
2652	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,337	YAMANAKA, NOBORU	
	Examiner	Art Unit	
	Allen T Cao	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/23/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 5-8 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US. 6,624,971 B1) in view of Ohtomo et al (US. 6,791,795 B2) and Chang et al (US. 6,069,775).

Sasaki discloses a thin film magnetic head comprising at least one writing element (figures 3A, 3B), the writing element including a first magnetic film 7, a second magnetic film 27, a gap film 9 and a coil film 29, the first magnetic film including two notches (figure 6) which are separated on the same plane level and to be opposite to a magnetic recording medium and a first pole piece (the portion between the two notches of the first magnetic film 7) which includes a uniform width portion which defines a uniform track width as viewed backward from a forefront of said first pole piece to be opposite to said magnetic recording medium by the distance between said two notches (figure 6), the second magnetic film including a second pole piece (the pole piece of the second magnetic film 27; particularly 27A(1)) and being adjacent to said first pole piece via the gap film, said coil film exciting a thin film magnetic circuit comprised of said first magnetic film, said second magnetic film and said gap film (column 11, lines 1-12);

wherein in said first pole piece, the height of said uniform width portion is defined by "TH1" (L1 = 0.3 μm to 0.8 μm); the depth of said uniform width portion to a top surface from a base plane of said first magnetic film is defined by "ND1" (Sasaki only

discloses that the thickness of the layer 7 is equal from 3 m to 4 m, but Sasaki does not disclose exactly how is the thickness of the first pole piece which is a portion located between two notches); and the thickness of said gap film is defined "WG" (WG = 0.1 μm to 0.3 μm).

Sasaki does not explicitly disclose that the relations of TH1≥4WG and NDI≥4WG are satisfied as set forth in claims 1 and 3.

Ohtomo et al discloses a thin film magnetic head having a writing element (figure 1) including a first magnetic film (18 and 19), a second magnetic film (8 and 13), a gap film 6 and a coil film (12 and 12'); two notches are formed on the top of the first magnetic front end layer by deposited the layer 24 which acts as a first pole piece; the second magnetic film including a second pole piece (the pole piece of the second magnetic film 8) and being adjacent to said first pole piece via the gap film 6, said coil film exciting a thin film magnetic circuit comprised of said first magnetic film, said second magnetic film and said gap film. Ohtomo et al also discloses that in the first pole piece, the height of said uniform width portion is defined by "TH1" (Ly = 0.8 mm); the depth of said uniform width portion to a top surface from a base plane of said first magnetic film is defined by "ND1" (Tr = 0.35 mm)); and the thickness of said gap film is defined "WG" (WG = 0.13 mm). Ohtomo et al discloses that the TH1≥4WG (0.8 mm > 4(0.13 mm)) and NDI<4WG (0.35 mm < 4(0.13 mm)).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the writing element of Sasaki with TH1≥4WG as set forth, supra as taught by Ohtomo et al.

The rationale is as follows: One of ordinary skill in the art would have been motivated to modify the writing element of Sasaki with TH1≥4WG as set forth, supra as taught by Ohtomo et al to improve track width accuracy, thus improve write characteristics.

Sasaki as modified by Ohtomo et al does not disclose the relation of NDI≥4WG. Ohtomo et al only discloses that ND1 is substantially equal 3WG.

Chang et al discloses a thin film head having a writing element including a first magnetic film (312, 318) having a first pole piece 318; a second magnetic layer 320 including a second pole piece 342; and a write gap there between 334; wherein NDI≥4WG (column 14, lines 34-39; (2 μm to 5 μm) is ≥ (0.1 μm to 0.5 μm))

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the writing element of Sasaki as modified by Ohtomo et al with ND1≥4WG as set forth, supra as taught by Chang et al.

The rationale is as follows: One of ordinary skill in the art would have been motivated to modify the writing element of Sasaki as modified by Ohtomo et al with ND1≥4WG as set forth, supra as taught by Chang et al to improve track width accuracy, thus improve write characteristics.

For claim 3, all the limitations are also met as set forth, in the above Office Action. Notes: Chang et al inherently discloses that the first magnetic film including a first pole piece (see above Office Action) and both are on a base plane (a base of the slider 42). Sasaki and Ohtomo et al also inherently discloses the first magnetic film including the first pole piece as set forth, supra are both on the base plane of the slider.

Regarding claims 5 and 7, Ohtomo et al discloses that the second pole piece includes a uniform width portion as viewed backward from a forefront of said second pole piece to be opposite to said magnetic recording medium (figure 1); and the height of said uniform width portion elongating backward from said forefront of said second pole piece is defined by "TH2" (Ly = 0.8 mm) is ≥ 4WG (WG = 0.13 mm).

Regarding claims 6 and 8, Sasaki inherently discloses that the second pole piece has the depth to a bottom surface adjacent to said gap film from a top surface of said second pole piece is defined by "ND2" (thickness of 27A = 3 μm to 5 μm) is ≥ 4WG (4WG = 4(0.15 μm – 0.3 μm) = 0.6 μm – 1.2 μm). Ohtomo et al discloses that the second pole piece has the depth to a bottom surface adjacent to said gap film from a top surface of said second pole piece is defined by "ND2" (Up1t = 2 mm) is ≥ 4WG (4WG = 4(0.13 m) = 0.52 mm).

Regarding claim 11, Sasaki discloses a reading element (figure 1A) having a first shielding film 3, a second shielding film (4, 6) and a MR 5 which is located between the first and second shielding films. Ohtomo et al discloses a reading element (figure 2) having a first shielding film 2, a second shielding film 22 and a MR 4 which is located between the first and second shielding films.

Regarding claim 12, Ohtomo et al discloses that the MR is made of a giant magnetoresistive effective film (column 4, lines 60-62).

Regarding claims 13 and 14, Ohtomo et al inherently discloses that the thin film magnetic head is supported by a head supporting device (column 13, lines 1-5); Chang

et al discloses that the thin film magnetic head is supported by a head supporting device (slider 42, suspension 44 and actuator arm 46).

Regarding claims 15 and 16, Ohtomo et al discloses a magnetic recording medium 17 to be magnetically written and read with cooperated with the magnetic head device; Sasaki discloses a magnetic recording medium (through out in the specification) to be magnetically written and read with cooperated with the magnetic head device; Chang et al discloses a magnetic recording medium 34 to be magnetically written and read with cooperated with the magnetic head device.

3. Claims 2, 4 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US. 6,624,971 B1) in view of Ohtomo et al (US. 6,791,795 B2).

Sasaki discloses a thin film magnetic head comprising at least one writing element (figures 3A, 3B), the writing element including a first magnetic film 7, a second magnetic film 27, a gap film 9 and a coil film 29, the first magnetic film including two notches (figure 6) which are separated on the same plane level and to be opposite to a magnetic recording medium and a first pole piece (the portion between the two notches of the first magnetic film 7) which includes a uniform width portion which defines a uniform track width as viewed backward from a forefront of said first pole piece to be opposite to said magnetic recording medium by the distance between said two notches (figure 6), the second magnetic film including a second pole piece (the pole piece of the second magnetic film 27; particularly 27A(1)) and being adjacent to said first pole piece via the gap film, said coil film exciting a thin film magnetic circuit comprised of said first

magnetic film, said second magnetic film and said gap film (column 11, lines 1-12) as set forth in claims 2 and 4;

Wherein the second pole piece includes a uniform width portion as viewed backward from a forefront of said second pole piece to be opposite to said magnetic recording medium, the height of said uniform width portion elongating backward from said forefront of said second pole piece is defined by "TH2" (L1) and WG, but Sasaki does not disclose the relation of TH2 ≥ 4WG as recited in claims 2 and 4.

Ohtomo et al discloses a thin film magnetic head having a writing element (figure 1) including a first magnetic film (18 and 19), a second magnetic film (8 and 13), a gap film 6 and a coil film (12 and 12'); two notches are formed on the top of the first magnetic front end layer by deposited the layer 24 which acts as a first pole piece; the second magnetic film including a second pole piece (the pole piece of the second magnetic film 8) and being adjacent to said first pole piece via the gap film 6, said coil film exciting a thin film magnetic circuit comprised of said first magnetic film, said second magnetic film and said gap film. Ohtomo et al also discloses that the second pole piece includes a uniform width portion as viewed backward from a forefront of said second pole piece to be opposite to said magnetic recording medium (figure 1); and the height of said uniform width portion elongating backward from said forefront of said second pole piece is defined by "TH2" (Ly = 0.8 mm) is ≥ 4WG (WG = 0.13 mm) as claimed in claims 2 and 4.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the writing element of Sasaki with TH2≥4WG as set forth, supra as taught by Ohtomo et al.

The rationale is as follows: One of ordinary skill in the art would have been motivated to modify the writing element of Sasaki with TH2≥4WG as set forth, supra as taught by Ohtomo et al to improve track width accuracy, thus improve write characteristics.

Regarding claims 9 and 10, Sasaki inherently discloses that the second pole piece has the depth to a bottom surface adjacent to said gap film from a top surface of said second pole piece is defined by "ND2" (thickness of 27A = 3 μm to 5 μm) is ≥ 4WG (4WG = 4(0.15 μm – 0.3 μm) = 0.6 μm – 1.2 μm). Ohtomo et al discloses that the second pole piece has the depth to a bottom surface adjacent to said gap film from a top surface of said second pole piece is defined by "ND2" (Up1t = 2 mm) is ≥ 4WG (4WG = 4(0.13 m) = 0.52 mm).

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen T Cao whose telephone number is (571) 272-7569. The examiner can normally be reached on Mon - Thurs (7:30 - 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Allen Cao
Primary Examiner

AC
March 14, 2005